

# **LAWRENCE LIVERMORE REPORT**

A weekly collection of scientific and technological achievements from Lawrence Livermore National Laboratory: Jan. 11 – 19, 2010

## **A CoLOSSIS scan into nuclear weapons**



### **The Confined Large Optical Scintillator Screen and Imaging System (CoLOSSIS)**

The same type of scanner used to peer into the body to detect cancers will be put to an even more delicate use -- checking on the viability of the nation's aging nuclear stockpile.

The National Nuclear Security Administration, part of the Department of Energy, said it has begun using computed tomography or CT scans -- an advanced type of X-ray -- to detect aging defects on critical components in the nation's nuclear weapons arsenal.

Technically, the scanners work exactly the same on nuclear weapons as they do on people, except the level of radiation or energy level is much higher when scanning metals as opposed to the low doses used in scanning a person.

The high-resolution scanner, called the CoLOSSIS (Confined Large Optical Scintillator Screen and Imaging System), was built by scientists at Lawrence Livermore.

To read more, go to [http://www.nytimes.com/reuters/2010/01/13/news/news-us-usa-weapons-viability.html?\\_r=1](http://www.nytimes.com/reuters/2010/01/13/news/news-us-usa-weapons-viability.html?_r=1)

## **Verifying greenhouse gas emissions**



A federal agency has awarded two researchers at Lawrence Livermore and colleagues from Scripps Institution of Oceanography \$1.2 million to develop methods to quantify regional greenhouse gas emissions from atmospheric measurements.

This capability is expected to become more important as legislation to reduce global warming becomes more widespread and greenhouse gas emissions trading markets emerge.

Livermore scientists Philip Cameron-Smith and Donald Lucas will work on the three-year project that will be based on continuous measurements of atmospheric greenhouse gases at two California locations. Computer models at Lawrence Livermore will analyze these measurements to trace emissions of the gases back to their sources.

To read more, go to <http://www.rdmag.com/News/Feeds/2010/01/policy-scripps-llnl-team-wins-grant-to-improve-greenhouse/>

### **Supercomputer facility goes green**



**Alison Terrill, LLNL principal architect, helped the Terascale Simulation Facility (TSF) receive gold distinction for going green.**

The Terascale Simulation Facility (TSF), the building housing the Laboratory's largest supercomputers, has received a Leadership in Energy and Environmental Design (LEED) gold level certification under the U.S. Green Building Council (USGBC) rating system.

LEED is an internationally recognized green building certification system that provides third-party verification that a building or community was designed and built using strategies aimed at improving performance in energy savings, water efficiency, carbon dioxide emissions reduction and other factors.

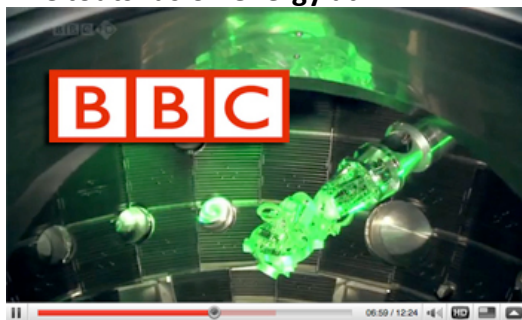
Completed in late 2004, the TSF is a 253,000-square-foot building that houses some of the world's fastest supercomputers, including Dawn (BlueGene/P), BlueGene/L and ASC Purple — Advanced Simulation and Computing (ASC) systems largely dedicated to stockpile stewardship.

LLNL's LEED certification submission was complicated by the fact TSF is a one-of-a-kind facility. Nonetheless, the submission scored 56 of 57 points pursued, earning a rare gold level certification. "This achievement demonstrates LLNL and NNSA's commitment to energy efficiency and reducing our carbon footprint," said Dona Crawford, associate director for Computation.

For more information, see the video

[https://newsline.llnl.gov/\\_rev02/articles/2010/jan/images/011510\\_images/TSF\\_LEEDS\\_newsline.mov](https://newsline.llnl.gov/_rev02/articles/2010/jan/images/011510_images/TSF_LEEDS_newsline.mov)

**BBC touts fusion energy at NIF**



**Inside the NIF target chamber.**

The National Ignition Facility, the world's largest laser system, located at Lawrence Livermore, was featured in the BBC broadcast "Horizon" hosted by physicist Brian Cox.

NIF scientists are conducting experiments this year to create fusion (the same power that is found in the sun) in a laboratory setting.

Go to [http://www.youtube.com/user/LivermoreLab#p/u/6/DyB7Ho\\_W9RE](http://www.youtube.com/user/LivermoreLab#p/u/6/DyB7Ho_W9RE) to view the NIF portion of the program, which was entitled "Can We Make A Star On Earth?"

### **New DOE manual opens the doors to carbon capture**



In an effort to help boost public awareness and support for carbon capture and storage projects, the Energy Department last week released a new manual for Carbon Capture and Sequestration (CCS) project developers.

The manual culls from what DOE has learned in six years of coordinating seven regional carbon sequestration partnerships to provide advice for helping mold public perception of such efforts.

Raising public awareness of CCS has been a priority of the regional carbon sequestration program since its start in 2003. The department realized early on that the public was generally unaware of the concept of carbon dioxide sequestration. It has since then worked to share information about the projects and goals of the partnerships with the communities near the nearly two dozen field verification test sites.

Go to [http://www.netl.doe.gov/technologies/carbon\\_seq/refshelf/BPM\\_PublicOutreach.pdf](http://www.netl.doe.gov/technologies/carbon_seq/refshelf/BPM_PublicOutreach.pdf) to read the manual.

### **Latest *Newsline* available**



*Newsline* provides the latest Lab research and operations news. See the most recent issue at <https://newsline.llnl.gov>

### Photo of the week



**Beauty is in the hand of the beholder:** Natalia Zaitseva and her team are growing and examining new crystalline compounds for use in small handheld neutron detection devices.

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LLNL applies and advances science and technology to help ensure national security and global stability. Through multi-disciplinary research and development, with particular expertise in high-energy-density physics, laser science, high-performance computing and science/engineering at the nanometer/subpicosecond scale, LLNL innovations improve security, meet energy and environmental needs and strengthen U.S. economic competitiveness. The Laboratory also partners with other research institutions, universities and industry to bring the full weight of the nation's science and technology community to bear on solving problems of national importance.

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